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What is Claimed is:

1. A method for compensating optical drift of a wavelength measurement system used for relative wavelength tuning of an output beam of an excimer or molecular fluorine laser system, comprising the steps of:

(a) operating the laser system including generating a laser beam and directing a beam portion through the wavelength measurement system;

(b) calibrating the wavelength measurement system to an absolute reference;

(c) tuning the output beam to a target wavelength using the wavelength measurement system;

(d) detecting a measured wavelength of the output beam using the wavelength measurement system after a predetermined period of laser operation;

(e) calculating a compensated wavelength by figuring in a previously determined drift compensation value; and

(f) adjusting the wavelength of the laser beam to the target wavelength when the compensated wavelength differs from the target wavelength.

2. The method of Claim 1, further comprising the step of repeating steps (d) through (f) a number times after additional periods of laser operation.

3. A method for operating an excimer or molecular fluorine laser system at a stabilized wavelength, the laser system including a wavelength

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measurement system calibrated to an absolute reference, for relative wavelength tuning, comprising the steps of:

(a) operating the laser system including generating a laser beam and directing a beam portion through the wavelength measurement system;

(b) calibrating the wavelength measurement system to an absolute reference;

(c) determining the wavelength of the laser beam, said wavelength determining step comprising the steps of:

(i) transmitting wavelength information measured by said wavelength measurement system;

(ii) retrieving a drift compensation value stored as corresponding to a current laser system operating condition; and

(iii) calculating the wavelength of the laser beam based on the transmitted wavelength information and the retrieved drift compensation value; and

(d) tuning the wavelength to a target wavelength when the determined wavelength differs from the target wavelength.

4. The method of Claim 3, further comprising the step of repeating steps (c) through (d) a number times after additional periods of laser operation.

5. A method for preparing an excimer or molecular fluorine laser system to operate at a stabilized wavelength by compensating optical drift of a wavelength measurement system used for relative wavelength tuning of an output beam of the excimer or molecular fluorine laser system, comprising the steps of:

(a) operating the laser system including generating a laser beam and directing a beam portion through the wavelength measurement system;

(b) calibrating the wavelength measurement system to an absolute reference;

(c) determining a value of the wavelength of the laser beam measured by the wavelength measurement system after a predetermined period of laser operation;

(d) comparing the value of the wavelength measured by the wavelength measurement system after said predetermined period of laser operation with an actual value of the wavelength of the laser beam; and

(e) determining a drift compensation value based on a result of the comparing step.

6. The method of Claim 5, further comprising the steps of:

(f) repeating steps (c) through (e) a number times after additional periods of laser operation; and

(g) storing the drift compensation values versus laser operation period of said wavelength measurement system for use with a wavelength stabilization routine of said laser system.

7. A method for preparing an excimer or molecular fluorine laser system to operate at a stabilized wavelength by compensating optical drift of a wavelength measurement system used for relative wavelength tuning of an

output beam of the excimer or molecular fluorine laser system, comprising the steps of:

(a) operating the laser system including generating a laser beam at a target wavelength by orienting a tuning optic of the laser system at a first position and directing a beam portion through the wavelength measurement system;

(b) calibrating the wavelength measurement system to an absolute reference;

(c) orienting said tuning optic to a second position such that the wavelength of the laser beam measured by the wavelength measurement system after a predetermined period of laser operation is at the target value;

(d) comparing the first position with the second position of the tuning optic; and

(e) determining a drift compensation value based on a result of the comparing step.

8. The method of Claim 7, further comprising the steps of:

(f) repeating steps (c) through (e) a number times after additional periods of laser operation; and

(g) storing the drift compensation values versus laser operation period for use with a wavelength stabilization routine of said laser system.

9. The method of any of Claims 1, 3, 5 or 7, further comprising the steps of calculating and storing data corresponding to corrected offsets for the

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wavelength measurement system following re-calibration to the absolute reference.

10. The method of any of claims 1, 3, 5 or 7, wherein the wavelength measurement system comprises a monitor etalon.

11. The method of claim 10, wherein the drift compensation values are determined by comparing wavelength values determined using the monitor etalon with values determined using a calibrated spectrometer in a test run.

12. The method of claim 10, wherein the drift compensation values are determined by comparing wavelength values determined using the monitor etalon with values determined using a reference optical transition line.

13. The method of claim 10, wherein the drift compensation values are determined by comparing wavelength values determined using the monitor etalon with values determined using a second monitor etalon that is re-calibrated periodically, such that magnitudes of the drift compensation values are determined as the difference between the wavelengths measured by the first and second monitor etalons.

14. The method of claim 10, wherein the drift compensation values are tabulated with each entry in a table corresponding to a drift compensation value at a different amount of laser operation for a given set of laser operation conditions.

15. The method of claim 14, wherein the amount of laser operation is measured versus a parameter that generally increases as the laser operates, wherein that parameter is selected from the group of parameters consisting of as time, pulse count, input energy to the discharge, and total output energy.

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16. The method of Claim 15, wherein different tables are generated corresponding to differing values of laser operation conditions including at least one condition selected from the group of conditions consisting of repetition rate, burst rate, output power, optical arrangement, discharge conditions, gas mixture composition, gas mixture age, age of laser chamber and age of resonator optics.

17. The method of claim 10, wherein the drift compensation values are calculated from a function that is generated corresponding to measured amounts of drift of the monitor etalon versus periods of laser operation.

18. The method of claim 17, wherein the amount of laser operation is measured versus a parameter that generally increases as the laser operates, wherein that parameter is selected from the group of parameters consisting of as time, pulse count, input energy to the discharge, and total output energy.

19. The method of Claim 18, wherein different tables are generated corresponding to differing values of laser operation conditions including at least one condition selected from the group of conditions consisting of repetition rate, burst rate, output power, optical arrangement, discharge conditions, gas mixture composition, gas mixture age, age of laser chamber and age of resonator optics.

20. A software program running on a computer system coupled with a laser system, the computer system including a processor, wherein the program provides instructions to the processor to control the laser system to operate according to the steps set forth in any of claims 1-8.

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